REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 22-28, 30, 37 and 41-62 are currently being amended.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-2 and 15-62 are now pending in this application.

The Examiner objected to claims 23, 24, 25, 26 and 45-62 due to the use of the term "an encoder" or "a decoder," and noted that these terms should be replaced with terms referencing a device or apparatus in order to prevent rejections under 35 U.S.C. §112. In accordance with the Examiner's comments, Applicant has replaced "encoder" with "video encoder apparatus" and "decoder" with "video decoder apparatus." Applicant has also made a number of minor amendments to the claims, such as changing "indicator" to "identifier" for consistency and clarification purposes. In making these amendments, Applicant is not intending to narrow the scope of the claims for any reason.

The Examiner rejected claims 15, 21, 22, 23, 26, 28, 32, 33, 39, 40, 50, 51, 57 and 58 under 35 U.S.C. §102(b) as being anticipated by an article entitled "Concealment Techniques for Data-Reduced HDTV Recording" by Kharatichvili et al. The Examiner also rejected claims 16-18, 20, 24, 25, 30, 31, 34, 37, 38, 45, 48, 49, 52, 55 and 56 under 35 U.S.C. §103(a) as being unpatentable over the Kharatichvili et al. reference in view of U.S. Patent No. 6,351,493, issued to Reed et al. For the reasons discussed below, Applicant respectfully traverses these rejections.

The Kharatichvili et al. reference relates to an error concealment method for a digital video recorder that involves switching between a temporal error concealment method and a spatial error concealment method based on an indicator that has been already provided in the

encoded bit-stream. According to the Kharatichvili et al. reference, the indicator used to determine the type of error concealment method to be used at the decoder indicates whether intra-frame or intra-field coding has been used. This is particularly noted, for example, in Section 3.3, Page 179: "The previously discussed result suggests the implementation of a motion-adaptive concealment which switches between the spatial and temporal concealment as shown in Fig. 6. The adaptive switching is controlled by the mode decision flag for intrafield/intraframe coding, which is already available in the bit stream of the coded data." In other words, the indicator is therefore an encoding mode indicator provided in the encoded video signal.

In contrast, the currently-pending independent claims involve providing a separate error concealment method indicator in the encoded video signal to indicate a type of error concealment method that is to be used when an error occurs during decoding of a picture of an encoded video signal. This may comprise, for example, a temporally-predictive or a non-temporally-predictive (spatial) error concealment method.

As stated in the independent claims, the encoded video signal of the present invention includes an encoding mode indicator (PTYPE, page 17, line 3 and Figure 4 of the application) that indicates an encoding mode (for example, intra-coding mode or inter-coding mode) used to encode each picture of the encoded video signal. According to the pending independent claims, the video signal also includes an error concealment method indicator that is separate and therefore distinct from the encoding mode indicator. The Kharatichvili et al. reference does not disclose provision of a separate error concealment method indicator that is distinct from the encoding mode indicator, as provided by the pending claims. Therefore, Applicant's submits that the Examiner's rejections based upon the Kharatichvili et al. reference are improper.

In addition to the above, Applicant also notes that the providing of an error concealment method indicator that is separate from the coding mode indicator provides important technical advantages compared with the method disclosed in the Kharatichvili et al. reference. In particular, the inventor of the present invention as described in the pending claims has realized that an indication of encoding mode is not necessarily a reliable indicator for selection of an error concealment method. For example, a picture of a video sequence

encoded using a temporally predictive coding mode (e.g. an inter-coded P picture) may contain blocks or segments encoded using an intra-coding mode. This happens because video encoders are typically arranged to select an encoding mode to provide the best possible compression efficiency, and it may be more efficient to encode certain regions of a picture otherwise encoded using a temporally predictive coding mode in a non-temporally predictive manner (i.e. using intra-coding). This may be the case when a particular picture contains appearing objects, uncovering background, or transformations that cannot be represented by the motion model employed by the video coding method. As a result, there are sometimes intra-coded blocks or segments in pictures that are otherwise encoded using a temporally predicted coding mode. Thus, a simple indication of an encoding mode may not be sufficient to provide a reliable indication of the best error concealment method to be applied to all image blocks or regions within a given picture, i.e. there is not necessarily a correlation between a coding mode indication and an appropriate choice of concealment method.

Furthermore, some video encoders that are adapted to encode video sequences using a combination of intra-coded pictures (i.e. pictures that are encoded without the use of temporal prediction) and pictures encoded using temporal prediction (e.g. inter coded P pictures and / or bi-directionally predicted B pictures), are arranged to insert pictures encoded in intra-coding mode into the encoded video signal at regular intervals, thereby providing random access points into the encoded video signal. Thus, in this type of coding system, intra-coded pictures are not only used at scene changes where the image content of the pictures to be coded changes significantly, but also during sequences of inter-coded pictures which are likely to have similar image content. In this situation, it may be particularly inappropriate to rely on an encoding mode indicator to provide information relating to an appropriate error concealment method to be used should an error occur. This is because errors in some intra-coded pictures, specifically those present at scene changes, cannot be concealed using temporally-predictive error concealment methods and should be concealed using a non-temporally predictive error concealment method. On the other hand, errors in other intra-coded pictures, especially those introduced in sequences of inter-coded pictures to provide random access points, may be better concealed using temporally-predictive error concealment methods. In this kind of video coding scenario, the method of the Kharatichvili et al. reference, in which an encoding mode indicator is also used as an error concealment method

indicator, would clearly fail to identify the most appropriate error concealment method to be used in all situations.

Lastly and with regard to the Kharatichvili et al. reference's proposed dual use of an encoding mode indicator as an error concealment method indicator, Applicant respectfully submits that it would be counter-intuitive for a person skilled in the art to add a further error concealment method indicator to the encoded video signal. In particular, Applicant submits that the addition of a further error concealment indicator would not be contemplated by one skilled in the art since this would in more encoded data required to convey equivalent information. This contravenes a common conventionally-known objective of video coding, namely to reduce the amount of data required to represent a video sequence.

Regarding the Examiner's rejections under 35 U.S.C. §103 and the Reed et al. reference, this reference fails to cure the deficiencies of the Kharatichvili et al. reference. In particular and like the Kharatichvili et al. reference, the Reed et al. reference also fails to teach or suggest the presence or use of an error concealment method indicator that is separate/distinct from the encoding mode indicator. Therefore, Applicant submits that the Examiner's rejections based upon the combination of the Kharatichvili et al. reference and the Red et al. reference are also improper.

Because the Kharatichvili et al. reference fails to teach an error concealment method indicator that is separate from the encoding mode indicator, and because this reference also fails to suggest the benefits from such an arrangement, Applicant respectfully submits that the Examiner's rejection of independent claims 15, 16, and 20-28 are overcome. Furthermore, because the other claims rejected by the Examiner are dependent upon these independent claims, Applicant submits that each of the rejected dependent claims are allowable for at least the reasons discussed above.

Lastly, the Examiner has taken the position that claim 19 may be subject to a double patenting rejection due to the existence of claim 1. Although this objection is contingent upon the allowance of claim 19, Applicant respectfully traverses this potential objection at this time. In particular, Applicant notes that allowed claim 1 currently requires the calculating of a measure of the similarity between the first and the second pictures, as well as

the comparing of the measure of similarity with a predetermined criterion of similarity. Neither of these features are present in currently pending claim 19 or claim 15, the independent claim from which claim 19 depends. Therefore, Applicant submits that it is incorrect for the Examiner to assert that claim 19 and claim are substantially duplicates of each other. If the Examiner has any questions concerning this issue, he is encouraged to contact the Attorney for Applicant at his earliest convenience.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1450. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1450. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1450.

Respectfully submitted,

Date MAR 30, 2006

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